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(54) **System and method of battery life estimation**

(57) A device which includes a plurality of substantially identical batteries coupled via switching circuits to a power bus. Control circuits coupled to the batteries and the switching circuits to provide electrical energy to the bus from each of the batteries during a sequence of pre-determined time intervals wherein one of the batteries

provides electrical energy to the bus during a greater percentage of each tie intervals than the others of the plurality. Estimating remaining battery life of the others of the plurality in response to sensing that the one battery is substantial discharged.

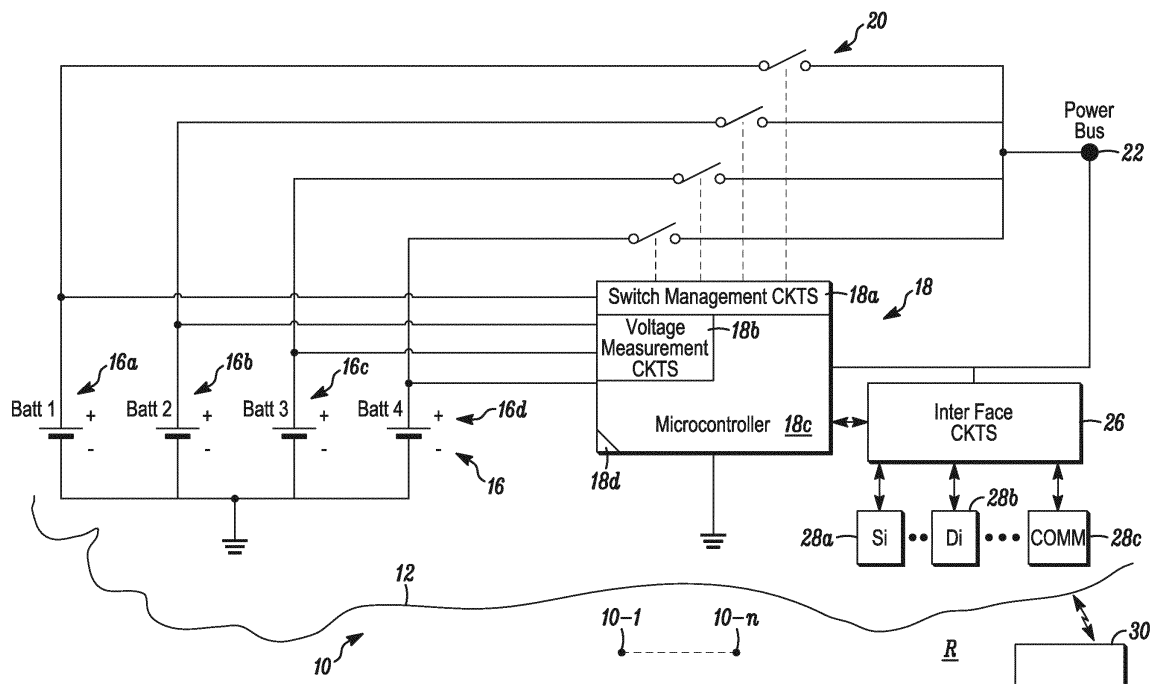


FIG. 1



EUROPEAN SEARCH REPORT

Application Number
EP 14 18 9813

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 268 710 B1 (KOGA KAZUNOBU [JP]) 31 July 2001 (2001-07-31) * column 1, line 5 - column 2, line 12; claims 1-4,6,7,9,11-13,16-19; figures 1,2,3A,3B,4A,4B,5,13A,13B,14,15 * * column 3, line 27 - column 6, line 67 * * column 9, line 38 - column 16, line 67 * -----	1-9,15	INV. G01R31/36 G08B29/18 H01M6/50
X	WO 95/19564 A1 (HEARTSTREAM INC [US]) 20 July 1995 (1995-07-20) * page 1, line 5 - page 3, line 23; claims 1-31; figures 1-3 * * page 4, line 5 - page 7, line 6 * -----	1-9,15	
X	US 2013/033114 A1 (LEE SEONGSOO [KR] ET AL) 7 February 2013 (2013-02-07) * paragraphs [0002] - [0008], [0021] - [0047], [0076] - [0082]; claims 1-15; figures 1-5,9 * -----	10	
A	WO 2013/022857 A2 (QUALCOMM INC [US]; FORUTANPOUR BABAK [US]; DANISKER LARISSA [US]; FRAN) 14 February 2013 (2013-02-14) * paragraphs [0002] - [0007], [0017] - [0026], [0034] - [0075]; claims 1-43; figures 1-4 * -----	1-15	TECHNICAL FIELDS SEARCHED (IPC) G01R G08B H01M H02J
A	WO 99/01918 A2 (ESTCO ENERGY INC [CA]; DUNN JAMES H [CA]; OLIVEIRA JULIO C DE [CA]; GE) 14 January 1999 (1999-01-14) * page 1; claims 1-7; figures 1-6 * * page 6, paragraph 2 - page 13, last paragraph * -----	1-15	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 September 2015	Examiner Bilzer, Claus
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1, 2, 6-9

an apparatus comprising a housing carrying circuitry.

2. claims: 3-5

an apparatus including a programmable processor.

3. claims: 10-15

an ambient condition detector comprising control circuits.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 18 9813

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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14-09-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6268710 B1	31-07-2001	JP 2001086656 A	30-03-2001
		TW 502152 B	11-09-2002
		US 6268710 B1	31-07-2001

WO 9519564 A1	20-07-1995	AU 691567 B2	21-05-1998
		CA 2180475 A1	20-07-1995
		DE 69533254 D1	19-08-2004
		DE 69533254 T2	25-08-2005
		EP 0739482 A1	30-10-1996
		JP H09511609 A	18-11-1997
		NO 962928 A	12-07-1996
		US 5483165 A	09-01-1996
		WO 9519564 A1	20-07-1995

US 2013033114 A1	07-02-2013	KR 20130015212 A	13-02-2013
		US 2013033114 A1	07-02-2013

WO 2013022857 A2	14-02-2013	US 2013148283 A1	13-06-2013
		WO 2013022857 A2	14-02-2013

WO 9901918 A2	14-01-1999	AT 360909 T	15-05-2007
		AU 8202298 A	25-01-1999
		DE 69837661 T2	27-12-2007
		EP 0992100 A2	12-04-2000
		WO 9901918 A2	14-01-1999

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82